

Docket No. F-8098

Ser. No. 10/751,378

AMENDMENTS TO THE CLAIMS:

Please replace the claims with the claims provided in the listing below wherein status, amendments, additions and cancellations are indicated.

1. (Currently Amended) An EGR gas cooling mechanism comprising:

a heat exchanger coupled to an introducing route and a delivery route for a cooling medium liquid for cooling EGR gas, the heat exchanger comprising:

a body pipe for transporting said cooling medium liquid, said body pipe including having an inlet for the EGR gas located at one end and an outlet for the EGR gas located at the other end, said body pipe including an introducing router for said cooling medium liquid disposed adjacent to said inlet for EGR gas and a deliver route for said cooling medium liquid disposed adjacent to said outlet for EGR gas, said EGR gas and said cooling medium liquid flowing in a concurrent direction;

a flowing route for EGR gas provided inside the body pipe, said flowing route comprising a plurality of pipes;

a temperature sensor disposed between said inlet for said EGR gas and said outlet for said EGR gas;

a controller connecting to said temperature sensor, said controller adjusting a supply amount of said cooling medium fluid; and

an expansion tank for absorbing expansion of the cooling medium liquid and maintaining a constant pressure within the heat exchanger;

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wherein a thermal medium fluid having a high boiling point of 150 degree Celsius or higher is supplied as the cooling medium liquid to the heat exchanger to prevent soot and condensed liquid from being attached to an inner surface of the flowing route of the EGR gas by heating operation for the inner surface of the flowing route of the EGR.

2. (Currently Amended) An EGR gas cooling mechanism comprising:

a heat exchanger coupled to an introducing route and a delivery route for a cooling medium liquid for cooling EGR gas, the heat exchanger comprising:

a body pipe for transporting said cooling medium liquid, said body pipe including ~~having~~ an inlet for the EGR gas located at one end and an outlet for the EGR gas located at the other end, said body pipe including an introducing route for said cooling medium liquid disposed adjacent to said inlet for EGR gas and a delivery route for said cooling medium liquid disposed adjacent to said outlet for EGR gas, said EGR gas and said cooling medium liquid flowing in a concurrent direction;

a flowing route for EGR gas provided inside the body pipe, said flowing route comprising a plurality of pipes;

a temperature sensor disposed between said inlet for said EGR gas and said outlet for said EGR gas;

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a controller connecting to said temperature sensor, said controller
adjusting a supply amount of said cooling medium fluid; and

an expansion tank for absorbing expansion of the cooling medium liquid
and maintaining a constant pressure within the heat exchanger;

wherein a controller for controlling supply of the cooling medium liquid
is provided at the flowing route in which a thermal medium fluid having a high
boiling point of 150 degrees Celsius or higher is supplied as the cooling
medium liquid to the heat exchanger.

3. (Original) The EGR gas cooling mechanism according to claim 2, wherein
the controller includes a circulation pump disposed at the introduction route for
the cooling medium liquid and a control valve, and wherein a supplying amount
of the cooling medium liquid supplied to the heat exchanger is controlled by
either or both of increasing and decreasing operation for flowing amount of the
circulation pump and opening and closing operation of the control valve.

4. (Original) The EGR gas cooling mechanism according to claim 2, wherein
the controller controls the supplying amount of the cooling medium liquid to the
heat exchanger according to any of temperature or temperatures at the surface
of the flowing route of the EGR, the outlet of the cooling medium liquid, and
the outlet of the EGR gas.

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5. (Original) The EGR gas cooling mechanism according to claim 1, wherein the heating operation for the inner surface of the flowing route of the EGR gas is made in range between 120 degrees Celsius and 150 degree Celsius.

6. (New) The EGR gas cooling mechanism of claim 1, wherein said temperature sensor is connected directly to at least one of said pipes in said body pipe.

7. (New) The EGR gas cooling mechanism of claim 2, wherein said temperature sensor is connected directly to at least one of said pipes in said body pipe.